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Benin. Much weight attaches to the opinion of M. Mer, who is a retired naval officer of forty years' experience, including three years of cruising between the equator and Gibraltar on the west coast of Africa.

The journey of Messrs. Capello and Ivens in central Africa during the past two years was beset with exceptional hardships. The explorers proceeded from the limits of the Portuguese territory in the direction of Cubango, as far as the lower part of the Mucussu, where they found themselves in a barren region intersected by water-courses and marshes, which obliged them to turn northward through an unknown region infested with tsetse, and affording little food. Sixteen of their party died from tsetse-bites, without counting cattle and hunting-dogs. After travelling 4200 geographical miles, they reached Feté almost exhausted, having lost sixty-two men during the fifteen months. The explorers reached Lisbon on the 17th of September, where they were received by the king, and welcomed by an enthusiastic demonstration of their countrymen.

Paulitschke has studied the relations of the western branches of the Somali, and the north-eastern tribes of the Gallas, near the Gulf of Aden. His results, with a good map showing their distribution and the route of the author and his companion, Hardegger, are to be found in the September number of the Proceedings of the Geographical society of Vienna.

The Bulletin of the Italian geographical society for September contains extracts from the unpublished journals of Pellegrino Matteucci, the African traveller. These have been edited by Dalla Vedova, and are illustrated by a map showing the itinerary and also the routes of Nachtigal and Rohlf's. Matteucci's journey, one of the most remarkable on record, extending from the Red Sea at Suakin to Lake Chad, and thence to the Niger and the sea, has hardly attracted the attention it deserves; chiefly, perhaps, on account of the early death of this promising and brilliant explorer.

The third part of the *Isvestia* of the Russian geographical society, for 1885, recently received, contains an important map by General Tillo, showing the lines of equal horizontal and total intensity of terrestrial magnetism in European Russia for the epoch 1880. It is accompanied by two smaller charts for the middle of the nineteenth century, showing the secular variation of the same elements. The same number contains an abstract of the report of the work done by the topographical corps of the general staff during 1884, the important details of which have been already noticed in *Science*.

#### ASTRONOMICAL NOTES.

**Occultations of  $\alpha$  Tauri.**—The occultations of this bright star and of a few of the other naked-eye stars of the Hyades will be visible again over a considerable portion of this country on the night of Dec. 19; but as the phenomena occur well on toward morning, they are not likely to be extensively observed. A most favorable opportunity, however, will occur on the night of 1886, Feb. 12, when a larger number of the stars will be occulted, and most of them early in the evening. Our observatories are so widely scattered that prediction for one place is of very little use for another (so rapidly does the parallax of the moon vary with hour-angle and zenith-distance), and each intending observer must predict them for himself with the data given in the *American ephemeris*. These recurring occultations of so many of the bright stars of the Hyades, which will continue for several years, afford pretty fair opportunities for a good determination of the semi-diameter of the moon, especially if the fainter stars (to the 8 mag.) can be filled in on a chart, and their occultations be predicted and observed at the dark limb of the moon. They also offer, to those who have the means of determining accurately their local time, but have never made a telegraphic determination of their longitude, the next best method of determining this, if they are willing to go through the somewhat tedious reduction of the observed occultations.

**The shower of Biela meteors.**—The earth received a visit, on the night of Nov. 27, from a part of the ghost of the lost comet of Biela, in the shape of a widely observed meteor-shower, a repetition of that of 1872, Nov. 27, and no doubt both of them parts of the meteor-stream which was once Biela's comet. It will be remembered that this comet separated into two during perihelion passage in 1845–46, came round in 1852 as two comets 1.5 million miles apart, with most extraordinary alternate fluctuations in brightness, and has been wholly invisible as a comet since then. But at its descending node, which the earth passes about Nov. 27, the comet's orbit closely approaches that of the earth, and an extraordinary meteor-shower from a radiant in Andromeda on 1872, Nov. 27, in which some single observers counted them at the rate of 4,000 or 5,000 per hour, has always been attributed to a meteor-stream into which Biela's comet is resolving itself. The present shower, so far as reports are at hand, does not seem to have equalled that of 1872, but it was a very decided one. At Georgetown, D.C., two of Professor Hall's sons and Mrs. Hall (the latter watching only a short time) counted 213 meteors between 6<sup>h</sup> 30<sup>m</sup> and 7<sup>h</sup> 50<sup>m</sup>. Angelo Hall, who

makes the report, describes them as generally small, from  $4^{\circ}$  to  $10^{\circ}$  in length, with occasional bright ones with short trains. At the same place, Mr. D. Horigan, one of the naval observatory watchmen, who had had considerable experience in meteor-observing, gathered a party of four to watch in the four quadrants, and their combined count gave —

Number from	7 <sup>h</sup>	0 <sup>m</sup>	to	7 <sup>h</sup>	30 <sup>m</sup> ,	100
"	"	7	30	"	7	55, 100
"	"	7	55	"	8	38, 100
"	"	8	38	"	9	0, 28

At 9 o'clock it became hazy and clouded over. Mr. Horigan describes them as occasionally as bright as the 3d mag., with short trains; color, white or violet; but most of them faint, and some scarcely visible. He fixes the radiant near  $\gamma$  Andromedae. From Syracuse, N.Y., are reported a shower at 7<sup>h</sup>, in which 120 were counted, and another about 9<sup>h</sup>, furnishing a count of 130, with no statement as to clearness of sky. Professor Pickering telegraphs from the Harvard college observatory, "Great shower, radiant,  $\chi$  Andromedae, observed at Geneva last night." The telegram is dated Nov. 28, and no doubt refers to Geneva, Switzerland.  $\chi$  Andromedae is very near  $\gamma$ . Newspaper telegrams also report brilliant showers at Elizabeth, N.J., at Teheran (Persia), and at Naples and London. It is evident that this meteor-stream, with a period of about  $6\frac{2}{3}$  years round the sun, is going to furnish an exceedingly favorable opportunity for studying the dispersion and distribution of comet material along its orbit.

#### NOTES AND NEWS.

DURING the past year the council of the New England meteorological society has engaged in the following branches of work: 1°. The securing of a corps of reliable observers of meteorological phenomena, with special attention to precipitation and temperature; 2°. The publication of the monthly bulletin; 3°. The dissemination of the daily indications of the U. S. signal service, and the local display of weather flags; 4°. The special investigation of thunder-storms. The work of securing reliable observations was so far advanced in November, 1884, as to warrant the issue of the first bulletin for that month, and its regular publication thereafter. The first bulletin contained reports from forty-five observers; that for September, 1885, from one hundred and twenty-three observers. As a result of the society's efforts, local weather flags are daily displayed in more than one hundred cities and towns of New England. The special investigation of thunder storms was made under the supervision of the secretary. More than four

hundred observers co-operated, the largest number of reports for any single storm having been two hundred and three. The preliminary study of the reports thus far made indicates that some interesting results have been obtained, which will be reported upon subsequently. The original membership of the society was 9; the number at the close of the year, 95. The expenses of the society have been kept within its income, but this has been done through the generous co-operation of friends who have from time to time contributed liberally to its resources. In looking forward to the work of another year, the council suggests that special efforts be made to add to the membership of the society, as well as to the list of observers. It must be remembered that the financial prosperity of the society depends on the number of members. It is desired to include in the membership all who are interested in meteorological studies in New England, whether they make observations or not. A member need not be an observer, nor is it required that an observer shall be a member.

— The preliminary circular proposing the formation of a State academy of science in Indiana, issued by authority of the Brookville society of natural history, has elicited such a general response in favor of the movement, that the same society has issued a circular calling a meeting of all the people of Indiana interested, to be held at Indianapolis on December 29. In order that an understanding may be had of the present state of scientific study in Indiana, the following persons have kindly consented to present papers upon the several subjects mentioned: Richard Owen, M.D., Sketch of the work accomplished for natural and physical science in Indiana; David S. Jordan, M.D., Ichthyology; Prof. John M. Coulter, Botany; Prof. J. P. Naylor, Physics; R. T. Brown, M.D., Geology; Prof. O. P. Jenkins, Lower invertebrates; E. R. Quick, Mammalogy; Prof. Robert B. Warder, Chemistry; Prof. O. P. Hay, Herpetology; Daniel Kirkwood, LL.D., Astronomy; P. S. Baker, M.D., Entomology; Maurice Thompson, Mineralogy; Rev. D. R. Moore, Conchology; Sergeant Orin Parker, Meteorology; J. B. Connor, Statistics; A. W. Butler, Ornithology.

— In the general English and American magazines for November there are very few articles of scientific interest. The *Century* contains another illustrated paper on 'Typical dogs,' the various breeds of setters being this month the topic of discussion. There is a short account, by as many different authors, of the history and characteristics of the Gordon setter, the American setter, the Irish setter, the Llewellyn setter, and the modern English setter. Perhaps this article would be